

Initially filed claims of the International Patent Application PCT/EP2004/008640

1. A stepping gear for a clamping and/or spreading tool having a stationary jaw and a support to which said stationary jaw is fixedly connected and on which a push or pull rod is slideably supported, a movable jaw being fixedly arranged on the push or pull rod, wherein said stepping gear is designed to displace said push or pull rod together with said movable jaw relative to said fixed jaw in an advance direction step-by-step with at least two different stepping sizes and comprises at least one operating arm operateable with at least two lever configurations characterized in that a mechanism for switching from a first lever configuration to a second lever configuration is provided, whereby upon an activation of the switching means, particularly in a predefined operating condition, the activated lever configuration enters engagement directly instantaneously.
2. A stepping gear according to claim 1, characterized in that the switching means is a mechanism for detaching a coupling structure between the operating arm and a driver via which the operating arm is engageable with the push or pull rod, whereby especially the decoupling means is designed as a load-dependent release means.
3. A stepping gear according to claim 1 or 2, characterized in that said recoupling means is provided to reinstate the detached coupling structure between said driver and said operating arm, wherein in particular that recoupling means is actuatable via a locking means for blocking displacement of the push or pull rod opposite to the advance direction.
4. A stepping gear according to one of the claims 1 to 3, characterized in that a permanently activated lever configuration is provided, particularly for a small stepping size displacement wherein, in particular if said detaching means is deactivated, an overriding or priority lever configuration, in particular for a displacement in a large stepping size, determines operation of said stepping gear and more particularly, if the detaching means is activated, the lever configuration having a large stepping size is deactivated and the lever configuration having a small stepping size is activated.

5. A stepping gear, in particular according to one of the claims 1 to 4, for a clamping and/or spreading tool having a stationary jaw and a support to which said stationary jaw is fixedly connected and on which a push or pull rod is movably supported, a movable jaw being fixedly arranged on the push or pull rod, said stepping gear being designed to displace said push or pull rod together with said movable jaw relative to said stationary jaw step-by-step in an advance direction and comprising two separately operateable operating arms which upon activation realize a displacement of the push or pull rod in the same advance direction.
6. A stepping gear according to claim 5, wherein said at least two lever configurations are alternately operateable, particularly alternately exclusively effective.
7. A stepping gear according to claim 5 or 6, wherein said two operating arms are pivotably linked to said support such that said operating arms feature opposing actuating directions.
8. A stepping gear according to one of the claims 5 to 7, wherein a force operating arm having a small stepping size is pivotably linked on an actuating side of said push or pull rod and is engageable on said actuating side of the push or pull rod with a driver via which the force operating arm cooperates operationally with said push or pull rod, wherein in particular a distance operating arm having a large stepping size and said force operating arm having a small stepping size are adapted to each other such that when one of the operating arms is operated the other acts as a counter arm.
9. A stepping gear, in particular according to one of the claims 1 to 8, for a clamping and/or a spreading tool, in particular for a bar clamp, the clamping and/or spreading tool comprising a stationary jaw and a support to which said stationary jaw is fixedly connected and on which a push or pull rod with a movable jaw fixedly connected thereto is movably supported, said stepping gear being designed to displace said push or pull rod in an advance direction step-by-step and comprising at least one operating arm to be operated in an operating direction, the operating arm being engageable with the push or pull rod according to a lever force transmission via a driver displaceable against a resetting or return spring, characterized in that said operating arm is pivotably mounted

on a clamping side of the push or pull rod and said operating arm has a location for introducing force into said driver, positioned on said clamping side of the push or pull rod such that said operating direction of the operating arm is substantially the same as the advance direction of said push or pull rod.

10. A stepping gear according to claim 9 characterized by an overload protection which is designed to detach a coupling of the driver with the operating arm as soon as a force release threshold is violated.
11. A stepping gear, in particular according to one of the claims 1 to 10, for a clamping and/or spreading tool, in particular for a bar clamp, wherein the clamping and/or spreading tool comprises a stationary jaw and a support to which the stationary jaw is fixedly connected and on which a push or pull rod with a movable jaw fixedly connected thereto is movably supported, the stepping gear being designed to displace said push or pull rod in an advance direction step-by-step and comprising at least one operating arm pivotably mounted on said carrier for engaging said push or pull rod in accordance with a lever force transmission via a driver displaceable against a reset spring, characterized in that a pivot bearing of said operating arm is arranged on an operating side of the push or pull rod and said operating arm has a location for introducing force into said driver on a clamping side of said push or pull rod opposite to the actuating side.
12. A stepping gear, in particular according to one of the claims 1 to 11, for a clamping and/or spreading tool, in particular for a bar clamp, the clamping and/or spreading tool having a stationary jaw and a support to which said stationary jaw is fixedly connected and on which a push or pull rod with a movable jaw fixedly connected thereto is movably supported, said stepping gear being designed to displace said push or pull rod in an advance direction step-by-step and comprising an operating arm and a driver via which said operating arm is engageable with said push or pull rod according to a lever force transmission, said operating arm being connected to the driver by a coupling member ensuring a stationary force transmission, characterized by a means for detaching the coupling between the driver and the operating arm.
13. A stepping gear according to claim 12, characterized by a recoupling means for reinstating a detached coupling between said driver and said operating arm.

14. A stepping gear, in particular according to one of the claims 1 to 13, for a clamping and/or spreading tool, in particular for a bar clamp, said clamping and/or spreading tool having a stationary jaw and a support to which a stationary jaw is fixedly connected and on which a push or pull rod is being movably supported, said push or pull rod having a movable jaw fixedly arranged thereto, said stepping gear being designed to displace said push or pull rod in an advance direction step-by-step and comprising an operating arm and a driver via which the operating arm is engageable with said push or pull rod, characterized by a constraint or forcing means maintaining said driver, at least in the inoperative operating state, canted to said push or pull rod and in permanent contact to the operating arm and a means for releasing the cant of said driver.
15. A stepping gear according the claim 14, characterized in that said release means is operateable by a locking means blocking the displacement of the push or pull rod in an opposite direction of the advance direction.
16. A clamping and/or spreading tool, in particular a bar clamp, comprising:
  - a push or pull rod,
  - a stationary jaw,
  - a support to which the stationary jaw is fixedly connected and on which the push or pull rod is movably supported,
  - a movable jaw fixedly arranged on the push or pull rod and
  - a stepping gear configured according to one of the claims 1 to 15.